

# interface...

A Cray Research, Inc. publication

May 1988



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*Joanne Whiterabbit, community affairs coordinator in Minneapolis, made fast friends at the Cray Talent Show with Al Olson and Mabel Johnson, residents of Augustana Nursing Home.*



*Don Ingraham works some of his magic on an unsuspecting member of the audience at the Augustana Nursing Home.*

## Cray employees act on their talents

It was yet another performance challenge, but it had nothing to do with supercomputers. The hardware consisted of a microphone, a piano, two tuxedoes, a briefcase, and an electronic keyboard. The software was the people — people who volunteered their time to share special talents and friendly smiles with others in the community.

"The road version," as emcee Mel Mitchell, employee development specialist in Mendota Heights, called it, "was made up of employees who performed in the talent show at the Cray Midwinter Party in Mendota Heights." On Wednesday night, March 29, they took their acts downtown Minneapolis to the Augustana Nursing Home and Park Center Apartments, an independent living complex for the elderly.

From 6:30 to 8:00 p.m., they shared their talents with an audience of about 90 senior citizens. Jeff Bowen, senior programmer analyst in Mendota Heights, began the evening by playing several piano pieces that he wrote. As Jeff played, the residents settled into their seats for a night of entertainment.

And entertaining is a good way to describe the second act, which featured Don Ingraham, software training instructor in Mendota Heights, and his friend, Josh Bright, as "The Dueling Magicians." No one disappeared as the two tried to "outmagic" each other by making coins and bills vanish and reappear, and by turning three ropes of different sizes into three ropes of the same size. And the residents clapped and cheered as Don ripped a newspaper into several pieces only to produce an intact front page seconds later.

"Our next act," Mel continued, "is two people who've been playing together a long time, but not as long as some of you people have been playing together." And he called attention to three couples at the nursing home that each had been married 60 years or more.

The couple that performed next was Tuan Low, senior analyst manager in Mendota Heights, and his wife

Janet, a former Cray Research employee. The piano duet included two polkas and the "Radetzky March" by Strauss. Tuan completed the act with a solo performance of the "Gershwin Prelude."

Art Brier, senior programmer analyst in Mendota Heights, wrapped up the evening with several old time favorites played on an electronic organ and synthesizer. "Alice Blue Gown" and "Twilight Time" had the residents tapping their feet and moving their shoulders to the music. Refreshments were served afterward, but many residents stayed in the auditorium to listen to Art, who was happy to continue playing. "I enjoyed myself," says Art. "It was very gratifying, and the people enjoyed it. That's the best part."

The residents weren't quite sure what the best part was. "The whole show was wonderful," says one woman. "I enjoyed every minute of it. It was so nice of you to come."

Two more women joined in with praise for Janet and Tuan. "You sure

know how to play the piano. The music was beautiful."

For another woman, Art's music brought back good memories. "Oh, how I wish my boys were here. They're just wild about that music."

In addition to the performers, there were other Cray Research employees who played an equally important role. They brought residents to and from the auditorium, poured punch, and spent time chatting with the audience. "Everything turned out so perfect," says Sherrill Norback, who works in marketing in Mendota Heights and is a member of the Employee Volunteerism Council (EVC). "Events like this give employees an opportunity to be active in the community. And you never know, you might just find a program you want to become more involved in."

The EVC was formed in January 1987 to promote volunteerism among Cray Research employees and to enhance the communities in which the company does business. There are

### Employee Volunteerism Council Members

|                    |          |
|--------------------|----------|
| Merrily Blagen     | CORPMPLS |
| Kevin Bluml        | SDEVMH   |
| Betty Christensen  | CORPMPLS |
| Fritz Ehlers       | MKTGMH   |
| Paul Ernst         | SDEVMH   |
| Bob Groethe        | CORPMPLS |
| Tessa Haas         | TRNGMH   |
| Doug Henry         | TRNGMH   |
| Elizabeth Knoll    | CORPMPLS |
| Diane Lien         | CORPMPLS |
| Marge Marah        | CORPMPLS |
| Melissa Mason      | SDEVMH   |
| Sherrill Norback   | MKTGMH   |
| Nancy Rowe         | MKTGMH   |
| Terri Santoorjian  | TRNGMH   |
| Pat Schmidt        | CORPMPLS |
| Paul Schoenholz    | CORPMPLS |
| Molly Warren       | CORPMPLS |
| Joanne Whiterabbit | CORPMPLS |

19 employees on the EVC, which meets once a month. This was the first group volunteer event for Minneapolis and Mendota Heights employees, and it won't be the last. "The EVC is trying to have one group volunteer event a month," says Terri Santoorjian, software training support staff in Mendota Heights and a member of the EVC. "We distribute a monthly newsletter to keep employees informed of volunteer events, and we encourage everyone to get involved."

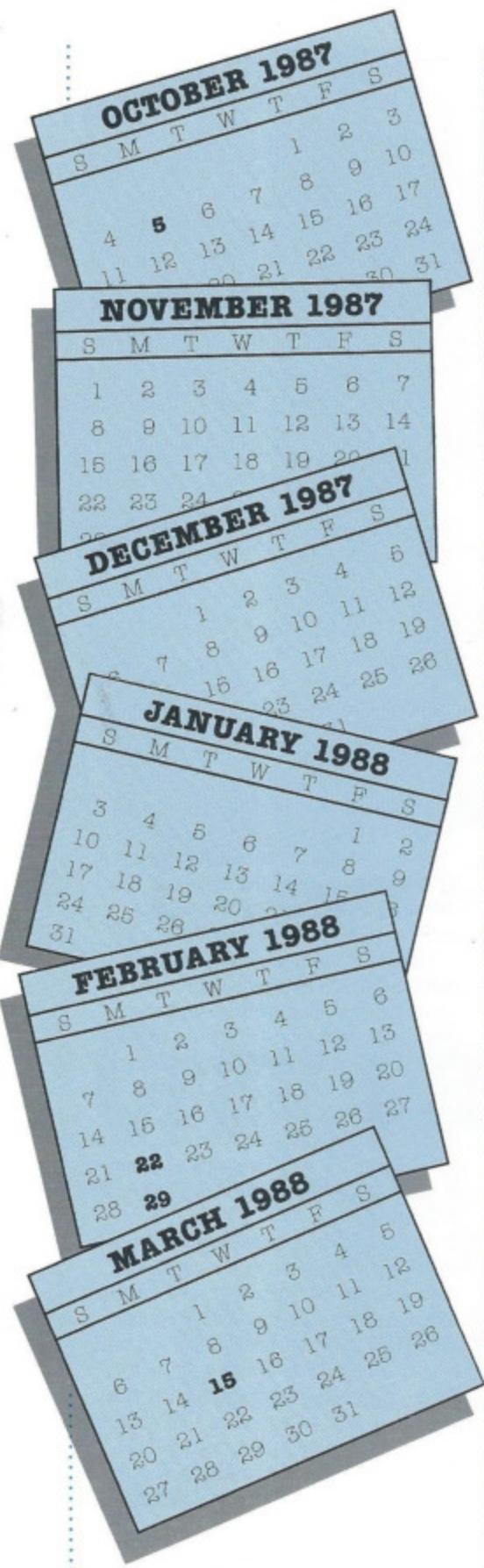
The EVC sponsored a food and clothing drive in April. Donations went to New Beginnings and the Goodwill, two non-profit organizations in Minneapolis. In May and July a group of employees will volunteer their time and assistance at a major Special Olympics event, and in June the EVC will prepare and serve a meal at the Dorothy Day Center in St. Paul.

"The EVC has some great volunteer opportunities on the agenda," says Joanne Whiterabbit, community affairs coordinator in Minneapolis and chairperson of the EVC. "It will be exciting to see how we can continue to share Cray talent with the people in our community. The talent show really was encouraging — I watched 20 people brighten the lives of over 90 people for one evening."



*Art Brier enjoyed playing old time favorites for the residents.*

# Cray Research delivers



**Ministry of International Trade and Industry (MITI):** We're looking for a vendor that can provide a supercomputer system with a vast array of applications software, a large mainframe system, various workstations, and a variety of other computer equipment.

**Cray Research:** We can do that.

**MITI:** We want our campus networking systems enhanced and expanded.

**Cray Research:** We can do that.

**MITI:** We want the entire system complete and ready to use by February 29.

**Cray Research:** We can do that... How are we going to do that?

This is an excerpt from the dialogue that took place between MITI, an agency of the Japanese government, and Cray Research, in late September. On October 5, Cray Research's bid was accepted. It was the largest prime contracting effort the company ever had attempted. Cray Research had five months to complete the effort and prove to MITI that it could, in fact, do what was asked, and in the time available. In addition, Cray Research was being watched.

"It was not just another sale," says Cal Kirchhof, applications manager in Mendota Heights. "It was a representation of a trade agreement between the United States and Japanese governments. It was a highly visible project for Cray Research. We were being watched by both governments and certainly the entire supercomputer industry."

## The plan

The computer site is located at the Agency of Industrial Science and

Technology (AIST) Tsukuba (pronounced scuba) Research Center, a very prominent organization in Japan. "AIST is one of the most well-known agencies in the Japanese community," says Yoshikazu Hori, president of Cray Japan. "Cray's show of performance and capability in front of such an agency will create more recognition of Cray Research among the Japanese people."

AIST already had a computer center, but they planned to build an addition to house the CRAY X-MP/218 and IBM 3090 systems. Sun graphics workstations, Hewlett-Packard engineering workstations, DEC workstations, and various VAX equipment would be installed in the surrounding laboratories and connected by an extensive network.

Cray Research had to work with many different vendors to deliver several hundred items.

On October 5, Cray Research's bid was accepted. It was the largest prime contracting effort the company ever had attempted.

"We worked with suppliers in Japan and other countries such as Denmark, France, and the United States," says Mike Anderson, the Cray Research, Inc. project manager. "It was a tough challenge to keep everything organized and on schedule."

## Software conversion

Certain barriers made the challenge even tougher. The Japanese government requested that all of the equipment for the project be

obtained through Japanese agents. This meant that all contracts and software licenses for MITI had to be translated to Japanese, which in some cases meant rewriting entire licenses. "Most vendors' licenses made some reference to payment conditions," Mike remembers. "The Japanese government procurement officials could not sign any contract that asked for payment — they could only pay Cray. And since the contract with Cray Research was the only document that could make payment conditions, we had to modify many licenses. Takeshi Jinnai, the Cray Japan sales account manager, was responsible for completing all contracts and licenses. It was a huge task."

A coordinated effort on everyone's part made it possible to meet the challenge.

There are nine different laboratories connected to the AIST Research Center, conducting research projects ranging from fermentation to polymers and textiles to mechanical engineering. Each lab needed distinct applications packages to enhance its research capabilities. And of the 50 applications packages, 50 percent never had run on UNICOS, the primary operating system used in the project. Moreover, some programs never had run on any Cray system. Cal Kirchhof and the applications group, working closely with Kazuya Terauchi, Cray Japan applications manager, successfully managed the effort and converted several programs to run on UNICOS. Their role was vital to the project.

"Without Cal and his team," says Mike, "we couldn't have converted and delivered all of the necessary software. They worked with many of the vendors, coordinated access to Mendota Heights, facilitated the conversions of applications, and kept

everyone informed about the status of the software conversion efforts. We depended heavily on them for all applications needs, and they came through."

That wasn't the only group to come through. Cray Japan employees Shinji Yamaguchi, Kazuya Nishi, Kashiro Yachimoto, and Takashi Fukuyama made significant contributions in applications, operating software, engineering, and site planning. A coordinated effort on everyone's part made it possible to meet the challenge.

### Networking

MITI wanted a complex network interconnection between the computers in the AIST Research Center and the workstations and smaller computers in the nine laboratories. This part of the project alone cost over two million dollars. The Cray system used four FEI-3 Sun VME interfaces for primary access to the CRAY X-MP/218 system and an FEI-1 front-end interface for access to the IBM 3090 system.

The network installation began in November. More than 2.5 miles of fiber optic and Ethernet cables were run between and within all of the laboratories. The new network will be tied to a Fujitsu FACOM M780 system, and via the IBM 3090 system, to the existing Research Information Processing System network. The result today is that hundreds of researchers now have access to applications programs that weren't available to them before.

### Meeting the deadline

Actual installation of the Cray and IBM computer systems began on February 22. At that time the only completed parts of the addition to the computer center were the computer room and the mechanical support room. Thanks to Shoichi Sugahara, Cray Japan MITI project manager, and his team, an effective

installation schedule and an acceptance plan were prepared, taking into account the seven days left until deadline and the following 15-day acceptance period. The Chippewa Falls site installation team, field support, and software development all played an important role in proving to MITI that Cray Research was indeed an excellent vendor choice.

"It was an incredible project...a great show of teamwork between Cray Japan, Minneapolis, Mendota Heights, and Chippewa Falls employees."

Overall acceptance of the project came on March 15, the exact day that MITI had asked for acceptance to be completed. "In 15 days," says Mike, "MITI verified the functionality and operation of all equipment, networks, and several applications.

"It was an incredible project," continues Mike. "It was a great show of teamwork between Cray Japan, Minneapolis, Mendota Heights, and Chippewa Falls employees. With this prime contract, each individual piece had to be accepted in order to get the entire project accepted. We delivered to MITI what it asked for, and we delivered on time."

While Cray Research delivered several hundred contract line items to MITI, Hori-san points out that one factor in particular was key. "The most important element of this project was people. The people of Cray Research, Cray Japan, and many software and hardware vendors, including Toshiba CAE systems, made great efforts to work together and make the largest and most expensive prime contracting effort in the history of Cray Research a great success."

We can do that — and we did. ●

# Education awarded high priority

Music, manufacturing, management, law, engineering, education, communication. These are some of the fields that children of Cray Research employees will study this fall as winners in the 1988 Cray Research Scholarship Program.

This is the eighth year of the scholarship program, and each year the dollar amount devoted to the awards has increased. In 1981, the scholarship program was initiated with a total of \$57,800. This year, the amount is over \$900,000.

Cray Research awarded 60 new scholarships in 1988. A total of 149 applications were received, which means 40 percent of all applicants received awards. The scholarships cover 75 percent of educational expenses and are renewable up to three times until the students complete their programs. Eighty-two past awards will be renewed in 1988. The new scholarships and the renewed scholarships together total 142 awards for 1988, a 27 percent increase over 1987.

The scholarship program remains a top priority in Cray Research's corporate giving efforts. "The scholarship program," says Bill Linder-Scholer,

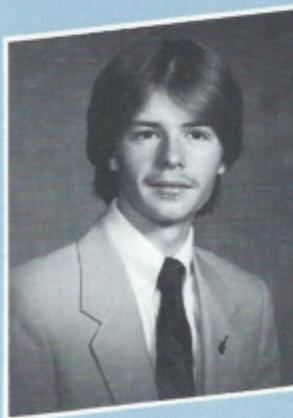
director of community affairs, "is one of three programs funded by Cray Research annually. Every year the scholarship program is the one that we allot money to first."

"The program is important," adds Bill, "because it reflects a company-wide interest in education, both for the organization as a whole and for individuals. As such, it is a top priority for Cray Research."

The scholarship program is designed to encourage and recognize academic achievement. Each applicant is evaluated on past academic performance and his or her potential to succeed in the chosen educational program.

Work experience, extracurricular activities, personal honors and achievements, and counselor's recommendations, as well as ACT and SAT test scores, grade-point average, and class rank are all taken into consideration when selecting the winners.

The Cray Research Scholarship Program is managed by Citizens' Scholarship Foundation of America (CSFA), a national student aid service organization. It is CSFA's job to conduct the scholarship competition



David Fernald



Krystyna Bednarz



Monica Tyson



Jeff Brost



Kristin Palm

"I'm working on double majors in finance and accounting. I also like chemistry, so maybe I'll be a budget director for Dow or DuPont or some other chemical company."

"I want to have an incredible grade-point average, so I can get into medical school."

"I'm going to get a degree in elementary education. Then I'd like to teach for about five years to get a feel for the profession. Eventually, I'd like to go to graduate school in psychology, and become a school psychologist."

"I'm going to get a degree in electrical engineering. Then I'd like to go to graduate school and learn more about the design of artificial limbs and organs."

"My long-term goal is to become a registered physical therapist. Currently I'm working on the prerequisites needed to apply for the physical therapy program at the University of Minnesota."

## Congratulations to the 1988 winners...

### Central Region

David Fernald, son of Carolyn Fernald  
Thomas Nelson, son of Elton Nelson

### Chippewa Falls

Amy Anderson, daughter of Harold Anderson  
Christopher Anderson, son of Joan Anderson  
Lisa Ashley, daughter of Steven Ashley  
Robert Bieze, son of Dennis Bieze  
Scott Bourget, son of Judith Bourget  
Jeffrey Brost, son of Gerald Brost  
Dustan Doud, son of Rose Haas  
Christopher Hammons, son of Ronald Hammons  
Paul Haslow, son of Randy Haslow  
Todd LaGesse, son of Julie LaGesse  
Darrell Lange, son of Thomas Lange  
Terry Larson, son of Katherine Olson  
Heidi Liedl, daughter of William Liedl  
DeAnne Loomis, daughter of Rose Loomis  
Neil Mathwig, son of Patricia Mathwig  
Carol Michels, daughter of Patricia Michels  
Sara Moulton, daughter of Sue Kay Moulton  
David Saye, son of Louis Saye  
Gregory Schindler, son of Linda Schindler  
Kathryn Steitz, daughter of Richard Steitz

### Eastern Region

Jocelyn Pedler, Karl and Kurt Speers, children of Meredith Speers  
Amy Shaffer, daughter of Vance Shaffer  
Luke Taylor, son of Terry Taylor

### Mendota Heights

Krystyna Bednarz, daughter of Roman Bednarz  
Julie Domanski, daughter of Joy Domanski  
Mark Douglass, son of Mary Douglass  
Cheryl and John Engberg, children of Robert Engberg  
Andra Hill, daughter of Gary Hill  
Cynthia Holly, daughter of Michael Holly  
Craig Kirkland, son of Clayton Kirkland  
Steven Lange, son of James Lange  
Kristin Lemmerman, daughter of Loren Lemmerman  
Jennifer Mroska, daughter of Wilfred Mroska  
Katrinka Somdahl, daughter of Eugene Somdahl  
Alicia Storma, daughter of Martin Storma  
David Thomas, son of Ethel Thomas-Giles  
Lorraine Turgeon, daughter of Neil Turgeon

### Minneapolis

Christine Johns, daughter of Ronald Johns  
Kristin Palm, daughter of Joan Palm

### Petroleum Region

Dayna Dealy, daughter of Dave Dealy,  
Robert Hill, son of Thomas Hill  
Cliff Liu, son of Edward Liu  
Kathleen Siebs, daughter of Carl Siebs

### Rice Lake

Aaron Dahlberg, son of Kathy Dahlberg,  
Jodi Jenson, daughter of Anita Jenson  
Lorrie and Melissa King, children of Donna King  
Bradley Raven, son of Patricia Raven  
Monica Tyson, daughter of Nancy Tyson

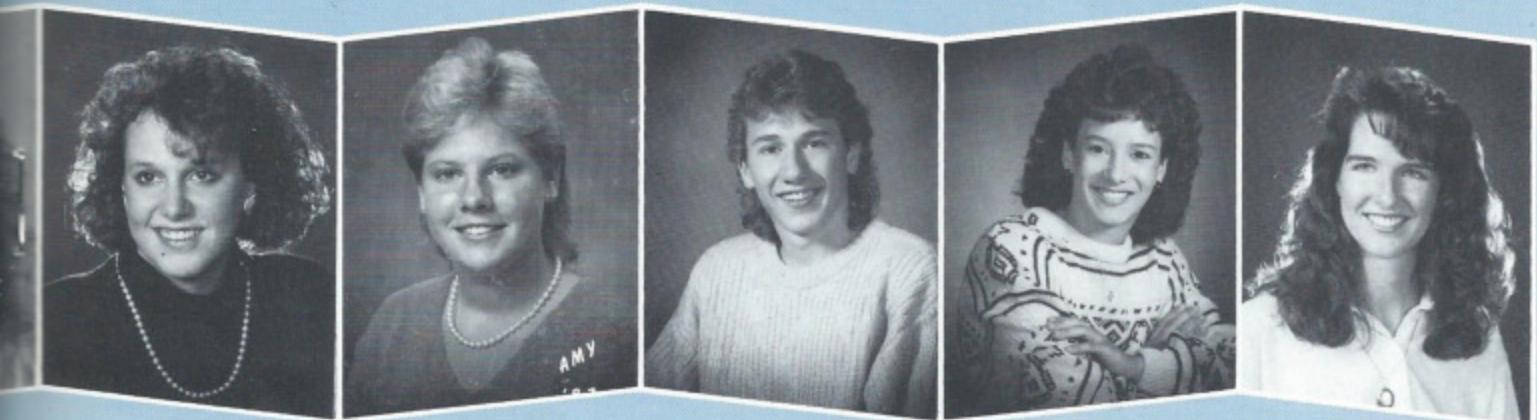
### Western Region

Nathan Geller, son of Alan Geller  
Kathryn Hardesty, daughter of Carol Hardesty  
Kristine Carlson, daughter of Sheila Carlson  
Charlotte Sykora, daughter of Ronald Sykora  
Brenda and Heidi Wilhelm, children of Michael Wilhelm

and select the winners impartially. This is done according to guidelines set by Cray Research, but no one from the company is involved in the selection process.

Listed above are the 1988 Cray Research Scholarship Program winners and their parents. And to get a better idea of what Cray Research

employees' kids are considering for their futures, we asked some of them what they'd like to accomplish with their scholarships. Their answers are below. ●



Christine Johns

Amy Shaffer

Terry Larson

Sara Moulton

Kristine Carlson

"I want to major in business management with a minor in accounting. I haven't decided yet on a specific position because I've got four years of school ahead of me. I want to examine my options."

"I want to be either an emergency room doctor or a radiologist at a clinic."

"I'm going to major in marketing education. When I'm done with school I'd like to be an entrepreneur. I really enjoy music so maybe I'll open a retail music store."

"I like business and accounting classes and working with people. I'm going for a degree in business administration. I want to be a chief administrator of a corporation."

"In college I'll major in environmental studies. Then I'd like to go on to law school and become an environmental lawyer. I'd enjoy doing consulting work for a corporation and working on issues like pollution control."

# Life after school



The school year winds to a close. For most youngsters, summer vacation means it's time to have fun. Some in the Chippewa Valley area of Wisconsin opt for fishing in the nearby creek, while others may travel to northern Minnesota to learn Chinese at a language camp. Still others spend a large part of every day meeting secretly in grass huts in a nearby field.

Whatever activity chosen, one thing is certain — the kids are not spending those summer days thinking about school. Their teachers, however, are. More than 500 western Wisconsin educators are gearing up for the 1988 Summer Cray Academy, a two-week summer camp that gives teachers the opportunity to examine technological and scientific innovation as it relates to the classroom.

Kindergarten through twelfth-grade educators will attend the Academy for many reasons. Highly experienced teachers might gain new ideas to help them make learning algebra fun. Others may attend a CAD/CAM workshop where geometry and coordinate principles will be applied to create a two-dimensional drawing. Still others may come for an update on what their students will need to know to meet future job requirements.

## A year-long effort

Through the Wisconsin Educational Partnership Initiatives (WEPI), a partnership was formed between Cray Research, Inc. and the Cray Research Foundation to improve science, math, and technology edu-

**Sue Garcia**, senior logic design engineer, Chippewa Falls  
Instructor of the middle school math workshop: Learning How Computers Think

*"My workshop will provide teachers with alternative tools for teaching binary number systems and negative numbers. Kids have to learn these things if society is to move smoothly into the computer age, because anyone who needs to understand how a computer really works must understand these number systems."*

**Juli Ahneman**, training administrator, Chippewa Falls  
Speaker at the symposium: Life After High School, Math Preparation for the Future

*"I would like to discuss the connection between math and problem-solving skills."*

*"To solve an equation, one has to evaluate the problem before an appropriate solution can be found. This evaluation process is a learned skill, and what better place to start learning but in math class? Talented math students are particularly good at logical thought processes. But any student can learn how to think analytically, and with practice, will strengthen problem-solving skills."*

cation for kindergarten through twelfth-grade students in the U.S. Grant monies totaling \$680,000 were made available to be used in education over the next two years. "The Academy will use a portion of these funds to further the WEPI philosophy," says Bill Linder-Scholer, executive director of the Cray Research Foundation.

During the 1987-1988 school year, WEPI gave grant monies to the schools for staff development programs and hosted tours of Cray Research facilities. In addition, some teachers received individual instruction from employees who volunteered time to share job-related experiences. All are outgrowths of WEPI funding, and reflect the company's involvement with the educational system during the school year.

The Academy, WEPI's first summer project, functions as a connector from school year to school year and focuses on the teacher. What is learned during the summer will be brought back to the classroom next

fall. "The Academy provides the continuity we need to ensure WEPI progress year-round," explains Bill.

### Starting progress early

The Academy, supported by both WEPI and the Education For Economic Security Act (a federal law that allocates money for staff educational development), consists of three components; keynote speakers and follow-up discussions, tours and field trips, and hands-on workshops.

The keynote speakers, scheduled to kick-off the Academy, will present their renditions of how the future may impact the way today's students live, work, and play. Nineteen area businesses, including Cray Research, will host tours to help illustrate what various industries are doing today. Workshops offering a variety of subjects, from geological sample collection and testing to incorporating the computer into mathematics classes, will round out each week.

The Academy will reach teachers throughout the entire Chippewa Valley area. "We've got a lot of employees in many towns throughout western Wisconsin," says Bill, "and it's important that WEPI reaches all of these towns. The Academy helps solve this challenge by assembling the teachers in one spot at one time.

Although it is offered only once a year, the Academy is part of a long-term commitment to help students of western Wisconsin schools increase their understanding of, and stimulate their interests in, science, math, and technology. And in doing so, the Academy will help them prepare for the 1988-1989 school year and beyond.

A number of Cray Research employees were asked to contribute some of their time to the Academy. One employee will conduct a workshop and others will be guest speakers in the math and science symposiums.

To gain some perspective on the nuts and bolts of these activities, *Interface* asked these people what they plan to discuss. ●

**Cindy Seniow, chemical engineer, Chippewa Falls**  
Speaker at the symposium: Life After High School, Math Preparation for the Future

*"Industry representatives like me can attend symposiums and tell high school teachers that math is important, but teachers don't need to be convinced of its importance. What the teachers need are ways to motivate these kids to believe that math is important. And that's not an easy job."*

*"The more examples we can share with teachers, the more examples they'll have to bring into the classroom. I would like to share tangible, real-life examples — like converting dollars to pesos or English measurements to metric measurements."*

**Bruce Schroeder, senior electronic technician, Chippewa Falls**  
Speaker at the symposium: Life After High School: Scientific Preparation For The Future

*"I plan to talk about how the job market has changed in the past 20 years. When I graduated from high school, I was anxious to get a job and get on with my life. I became a machinist because that was one opportunity available to me with a high-school education."*

*"However, today's advancing technology severely reduces the number of on-the-job training positions and unskilled labor jobs. Machinist positions, for instance, now require education beyond high school. Some people may get lucky and land a job that suits them and pays well — but it's a competitive job market, and I wouldn't base my future on luck."*

**Tom Taylor, senior integrated circuit process engineer, Chippewa Falls**  
Speaker at the symposium: Life After High School: Scientific Preparation For The Future

*"Some individuals would like to pursue additional education after high school, but can't for one reason or another. Maybe the funds aren't there, or family situations prevent them from doing so."*

*"I'm going to talk about resources such as job placement centers or libraries, which can be used to maximize the chance of finding a career without following the formal education route."*

# 10.....

## News Briefs

### Nine Bavarian universities to use Cray system

On March 30, Cray Research announced that Leibniz Rechenzentrum (LRZ) of the Bavarian Academy of Sciences in Munich, West Germany, ordered a CRAY X-MP/24 computer system. The supercomputer, which will be purchased, will be installed in the fourth quarter of 1988 pending export license approval.

The Cray computer will be used by the Bavarian Academy of Sciences and all nine Bavarian universities for basic research and engineering applications.

### Is there an award for this?

March 13 marked the end of a full year of uninterrupted running time for Serial 216, a CRAY X-MP system at the University of Illinois. "The mainframe and I/O subsystem did not have a hardware failure for over a year — that's about 8,500 hours," says Rene Copeland, district sales manager in Chicago.

Uninterrupted time means error-free running, and excludes system



down time for scheduled preventative maintenance (PM). "Generally, the company doesn't keep statistics in this manner, so it's hard to determine without actually doing some homework whether it's a one-of-a-kind record. But according to the research we did, nobody's done it so far, so I feel safe in saying it's a record," explains Rene.

This record would not have been possible without top-notch PM, diagnostics, and performance by the following Cray Research site employees:

Rick Swartz, engineer in charge  
Scott Coyle, field engineer  
Jason Smith, senior field engineer  
Dale Purdy, analyst in charge, and  
Brad Woodworth, senior programmer analyst.

Another person to recognize in all of this is Tom Bentley, district field engineering manager. Tom manages two other Cray sites (Ford Motor Company and General Motors Corporation) with systems that have run uninterrupted for 4,000—5,000 hours each. "I maintain that it's not by accident that it happens at Bentley's sites," interjects Rene.

Congratulations all!

### Leadership Day tapes available

Audio tapes of Leadership Day now are available for everyone in the company. Speakers include: John Rollwagen, Seymour Cray, John Carlson, Mike Lindseth, Greg Barnum, Les Davis, Dean Roush, Don Whiting, Bob Ewald, Marcelo Gumucio, John Aldag, and Gary Smaby from Piper, Jaffray and Hopwood.

Copies of these tapes are available in many of the company resource centers. In Mendota Heights contact Barb Lapensky; in Chippewa Falls, Joni Herren; and in Minneapolis,

Deb Ivens. Region and subsidiary employees should check with their human resources representatives.

### For your information

If you are a stockholder (and most employees are), you may be interested to know that Cray Research has appointed a new stock transfer agent. Effective January 20, Norwest Bank Minnesota became the transfer agent for Cray Research's common stock, and in this role, will provide all services formerly offered by First Trust Company, Inc.

All accounts automatically have been transferred to Norwest, so no action is necessary on your part. For future reference, if you have any of the following changes, please notify the transfer agent in writing immediately:

change of address,  
change in name, or  
lost stock certificate(s)

The new address is:  
Norwest Bank Minnesota, N.A.  
Corporate Agency Department  
161 North Concord Exchange  
P.O. Box 738  
South St. Paul, MN  
55075



### 401(k) update

The U.S. government increased the maximum dollar amount an employee can allocate to a 401(k) plan for 1988 from \$7,000 to \$7,313. The Cray Research Deferred Profit Sharing and Investment Savings Plan is a 401(k) plan. Adjustments are determined by the federal government on January 1 of each year and are based on the cost of living. Employee contributions automatically will be

discontinued when the maximum is reached and resumed at the beginning of the next plan year.

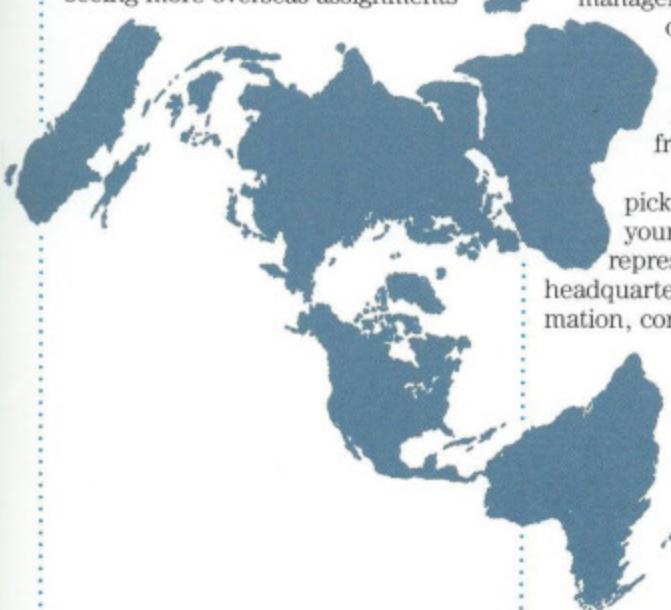
Last year 2,793 employees, 77 percent of all eligible employees, participated in the Investment Savings portion (which is our form of a 401(k) plan) of the Deferred Profit Sharing and Investment Savings Plan. These participants contributed a total of \$5,447,438 to the program. Cray Research contributed \$7,047,053 to the Plan for the 1987 year, including deferred profit sharing and the limited match of employee contributions.

The Deferred Profit Sharing and Investment Savings Plan is Cray Research's primary retirement program and offers an attractive method of saving for long-term needs. Employees may contribute up to 15 percent of their pay before taxes (but not more than \$7,313 in 1988) to the plan each year. Profits permitting, the company matches the first two thousand dollars of employee savings with fifty cents for each employee dollar saved.

For more information, contact your human resources representative.

### Cray world

"Cray Research is truly becoming an international company," said John Rollwagen at the fourth quarter employee meetings, "and we will be seeing more overseas assignments



in the future." As evidence of this, human resources is gathering names of employees who are interested in working outside the U.S. Possible locations may include Asia, South America, and Scandinavia.

For starters, human resources is working on some preliminary fact-finding. "We would like to find out which people are interested, and what their job skills are," explains Lis Wierum, human resources

manager in Minneapolis. The job openings, which will be in hardware and software site support and site management, will last from one to three years.

If you are interested, pick up a questionnaire from your local human resources representative or corporate headquarters. If you want more information, contact Lis Wierum.

### CRAY RESEARCH, INC. AND SUBSIDIARIES

Consolidated Summary of Earnings (Unaudited)

(In thousands, except per share data)

|   | Three months ended March 31 |           |
|---|-----------------------------|-----------|
|   | 1988                        | 1987      |
| Revenue   | \$145,871                   | \$214,147 |
| Operating costs and expenses                                      | 109,721                     | 122,821   |
| Operating income  | 36,150                      | 91,326    |
| Other income  | 4,314                       | 2,818     |
| Earnings before income taxes                                      | 40,464                      | 94,144    |
| Provision for income taxes  | (14,073)                    | (36,914)  |
| Net earnings  | \$ 26,391                   | \$ 57,230 |
| Earnings per common and common equivalent share                   | \$ .85                      | \$ 1.79   |
| Average number of common and common equivalent shares outstanding | 32,311                      | 32,451    |

### First quarter financial results

On April 19, Cray Research reported revenue of \$145,871,000 and net earnings of \$26,391,000, equal to \$.85 per share, for the first quarter ended March 31. This compares with revenue of \$214,147,000 and net earnings of \$57,230,000, or \$1.79 per share, in the first quarter of 1987.

John Rollwagen says that results for the quarter "were stronger than anticipated, as some revenue expected for the second quarter shifted to the first." He adds that "our outlook for the year in terms of revenue and earnings remain unchanged. We signed 14 orders during the quarter, which means we are off to a good start in meeting our marketing objectives for 1988."

Of the 14 contracts signed, nine were purchased and five were leased. The company installed 11 new and three used computer systems. The value of new systems installed during the quarter averaged \$12 million.

**SPIP update**

The aftermath of the October 1987 stock market crash left many people wondering about their investments. At Cray Research, employees who chose to participate in the Stock Purchase Investment Plan (SPIP) during the 1987-88 plan year also may be wondering how market adjustments will affect their investment.

As a result of the significant downward shift in the entire stock market, it is likely that Cray Research stock will sell at a lower price per share at the end of the plan year (May 31, 1988) than it did at the beginning of the plan year (June 1, 1987). The purchase price still will be deter-

mined by the same procedure used in past years. It will be the lower of:

- 85 percent of the market price at the beginning of the plan year,
- or 85 percent of the market price at the end of the plan year.

The maximum number of shares that each employee can purchase is determined at the beginning of the plan year by multiplying the employee's contribution per paycheck by the total number of pay periods, and dividing that number by 85 percent of the price of the stock at the beginning of the plan year.

So if the market price is lower at the end of the plan year, the funds in each participant's account will be used to purchase the previously determined number of shares, and the

remainder of the funds plus interest will be returned to the participant as cash.

Participants, however, are not required to buy the stock. At the end of the plan year they may take the entire balance of their SPIP account in cash.

Depending on their choices, employees who participated in the SPIP during the 1987-88 plan year will receive the following at the end of June: a check for the dollars remaining after the maximum number of shares are purchased, a certificate for the shares purchased, a statement of the account showing contributions, interest, and the stock purchase, or a check for the entire balance of the SPIP account.

### SPIP Participation\* (1981-1988)

| Year    | Total Employment | Number of Plan Participants | Percent of Employee Participation | Average Annual Contribution as a Percent of Eligible Salary |
|---------|------------------|-----------------------------|-----------------------------------|---|
| 1981    | 707              | 495                         | 70%                               | 6.0%  |
| 1982    | 935              | 603                         | 65%                               | 6.9%  |
| 1983-84 | 1,279            | 675                         | 53%                               | 7.2%  |
| 1984-85 | 1,575            | 750                         | 48%                               | 6.4%  |
| 1985-86 | 2,126            | 1,266                       | 60%                               | 4.1%  |
| 1986-87 | 3,320            | 2,324                       | 70%                               | 8.0%  |
| 1987-88 | 3,823            | 2,731                       | 71%                               | 8.7%  |

\*Pertains to domestic employees only.

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